

Remarks:

Claims

By the present amendment, claim 25 has been amended to correct a typographical error.
Claims 3-18, 20 and 25-26 are pending.

Claim Rejections - 35 U.S.C. §103(a) - Hirota '927 and Hirota '246

Claims 3-5 and 10-18 and 20 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Hirota et al. (Hirota'927) (U.S. Patent No. 6,233,927) in view of Hirota et al. (Hirota'246) (U.S. Patent No. 6,367,246). In particular, the Office Action contends that Hirota'927 discloses a diesel engine exhaust system having a soot filter, and low temperature NO₂ trap deposited on a carrier upstream and in train with the soot filter. The Office Action however, submits that Hirota'927 fails to disclose low temperature NO₂ trap material comprising zeolites selected from the group consisting of acidic zeolites and base-metal-exchanged zeolites.

Furthermore, the Office Action purports that Hirota'246 teaches that use of low temperature NO₂ trap material comprising zeolites selected from the group consisting of acidic zeolites and base metal-exchanged zeolites for absorbing NO_x (when the air-fuel ratio of the exhaust stream flowing into the absorbent is lean) and releasing NO_x (when the air-fuel ratio of the exhaust flowing into the absorbent is rich) is conventional in the art. The Office Action asserts that use of a low temperature NO₂ trap material comprising zeolites (as disclosed in Hirota'246) would have been obvious to one of ordinary skill in the art at the time of the invention to: absorb NO_x, (when the air-fuel ratio of the exhaust stream flowing into the absorbent is lean) and release NO_x (when the air-fuel ratio of the exhaust flowing into the absorbent is rich); to reduce the poisoned materials in the purifying catalyst; and to reduce the amount of nitrogen oxides in the exhaust gas stream of a lean burn engine.

Applicant respectfully disagrees. The rejection is deficient because to establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the cited references. MPEP § 2143.03. In particular, Hirota'246 fails to teach low temperature NO₂ trap material comprising zeolites selected from the group consisting of acidic zeolites and base-metal exchanged zeolites. Applicant notes that the portion of Hirota'246 where the Office Action cites a description of NO₂ trap material (i.e., col. 3, lines 32-67; col. 4, lines 1-14) does

not, in fact, disclose the low temperature NO₂ trap material described in instant claim 3.

Hirota'246 describes the NO₂ trap material as follows at col. 3, lines 61-66:

The NO_x storing member **62** is formed of a NO_x adsorbent **62a**. This NO_x adsorbent **62a** is comprised of at least one selected from a precious metal including palladium Pd, platinum Pt, and rhodium Rh, a transition metal including copper Cu and iron Fe, and lithium Li, carried on a carrier of alumina, for example...

The above description clearly does not describe NO_x adsorbent formed of zeolite materials.

Applicant submits that Hirota'246 does disclose zeolite materials. However, these zeolite materials are disclosed in the context of their use as hydrocarbon adsorbent (see col. 4, lines 14-19). Accordingly, absent the disclosure of low temperature NO₂ trap material comprising zeolites selected from the group consisting of acidic zeolites and base-metal exchanged zeolites as required in Applicant's claim 3, the cited references fail to teach or suggest all of the claimed limitations. Reconsideration of the rejection under 35 U.S.C. § 103 is therefore respectfully requested.

Claim Rejections - 35 U.S.C. §103(a) - Hirota '927, Hirota '246 and Deeba

Claims 6-9 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Hirota'927 in view of Hirota'246 as applied to claims 3, 17-18 and 21, and further in view of Deeba et al. (U.S. Patent No. 6,093,378). Specifically, the Office Action posits that the combination of Hirota'927 and Hirota'246 discloses all the claimed limitations except that the zeolites have a trivalent metal which in combination with the Si forms an oxidic skeleton. The Office Action asserts that Deeba et al. discloses low temperature NO₂ trap material (deposited on a carrier) wherein the zeolites comprises a trivalent metal which in combination with Si forms an oxidic skeleton. The Office Action concludes that it would have been obvious, in view of Hirota'927, Hirota'246 and Deeba et al., to one of ordinary skill in the art at the time the invention was made to use low temperature NO₂ trap material comprising zeolites for the purposes of absorbing NO_x (when the air fuel ratio is lean) and releasing the NO_x (when the air fuel ratio is rich).

Applicant respectfully disagrees with the rejection regarding claims 6-9. As noted above, Hirota'246 fails to disclose use of zeolites selected from the group consisting of acidic zeolites

and base-metal exchanged zeolites as low temperature NO₂ trap material as required by Applicant's claims. Therefore, the rejection of claims 6-9 further in view of Deeba cannot stand.

Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

Claim Rejections - 35 U.S.C. §103(a) - Hirota '927, Hirota '246 and further in view of design of choice

Claims 25-26 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Hirota'927 in view of Hirota'246 and further in view of design of choice. The Office Action contends that Hirota'927 and Hirota'246 discloses all the claimed limitations except that NO₂ trap material adsorbs NO₂ at 25 °C to 200 °C and releases NO₂ above 175 °C. The Office Action, however, purports that it would have been an obvious matter of design choice that would be within the purview of one of ordinary skill in the art.

Applicant respectfully disagrees with the rejection as applied to claims 25-26. As noted above, Hirota'246 fails to disclose use of zeolites selected from the group consisting of acidic zeolites and base-metal exchanged zeolites as low temperature NO₂ trap material as required by Applicant's claimed method. Therefore, the rejection of claims 25-26 is misapplied. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

FEE DEFICIENCY

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Closing Remarks

Applicants thank the Examiner for the Office Action and believe this response to be a full and complete response to such Office Action. Accordingly, favorable reconsideration in view of this response and allowance of the pending claims are earnestly solicited.

Respectfully submitted,



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